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NEVADA COOPERATIVE SNOW SURVEYS

Part II. Humboldt River Basin,
Eastern and Southern
Nevada, and Nevada
National Wildlife Refuges.

Seasonal snow survey and Kindred Data,
March 1, 1942

Issued in cooperation with the Nevada
Agricultural Experiment Station, United States
Division of Irrigation of the Soil Conservation
Service, Forest Service, Bureau of Reclamation,
Weather Bureau, Geological Survey, Fish and Wild-
life Service, Humboldt River Water Users, Nevada
State Engineer, and Elko-Lamoille Power Company.

Nevada Agricultural Experiment Station

Reno, Nevada

MARCH 1, 1942

-PROGRESS-

The experience of 1941 and earlier years has demonstrated that a forecast for the flow of Great Basin streams cannot be attempted until the April 1 snow surveys have been made since the snowfall or lack thereof during the month of March makes a large difference in the expected yield of the watershed. The forecast has not been released until about April 10 for many years although the principal survey was made on March 1. Since there are some engineers and others that are interested in the data as soon as the surveys are made, it was deemed advisable to issue a bulletin giving this information as soon after March 1 as possible.

In this bulletin, no attempt is made to give a forecast of the expected runoff of the streams. The data are published as received and computed and comparative figures of the water content on the courses for the past several years are given for the sake of those who desire to make their own study of the snow storage situation. There is also a table given which shows the increase or decrease of the snow water-content on the key courses during the month of March as shown by the March 1 and April 1 surveys. This table demonstrates the uncertainty of the amount of the final snowpack as shown by March 1 measurement.

The regular forecast of stream flow together with detailed data will be issued, as in the past, about April 10th.

To the list of cooperators has been added the Nevada and Toiyabe National Forests that have established new courses in Baker and Snake Creeks, Charleston Mountain, and Reese River. On the basis of the snow surveys in the Santa Rosa Range forecasts also will be initiated for Quinn River. The United States Fish and Wildlife Service has joined the other national services cooperating in snow surveying. The Las Vegas Chamber of Commerce assisted in establishing the snow courses on Charleston Mountain in southern Nevada, laid out to forecast the fluctuations of the artesian wells at its base.

1. UPPER HUMBOLDT BASIN

Temperature departure Nov.-Feb. Elko -0.4F.

mean temperature above freezing 5.10F. (accum.)

Elevation feet	Date	Snow depth inches	Density percent	Water content inches	Normal water content Mar. 1	Percentage of March 1 normal	Seasonal precip. percentage of normal at U.S. L.B. stations Nov.-Feb.
<u>Northern Feeders</u>							
<u>Marys River</u>							
Bear Creek 8100	Mar. 2	58.9	31.1	18.3	11.3	36.7	Jarbridge-Mala Vista (6,100-5,585 ft.)
Fox Creek 6900	Mar. 3	34.1	28.7	9.8			
Marys River 8000	Feb. 28	60.0	29.4	17.7			
<u>Marys River-North Fork</u>							
Big Bend 6800	Mar. 4	32.2	31.7	10.2	11.5	38.7	
Gold Creek R.S. 6600	Mar. 3	28.0	29.0	8.1	9.4	86.2	
<u>North Fork</u>							
Jack Creek 7800	Feb. 27	35.3	32.5	11.5	7.7	87.0	Owyhee-North Fork-Tuscarora (6,500-5,400 ft.)
Jack Creek 7000	Feb. 27	20.8	32.3	6.7			
Rodeo Flat 7000	Feb. 28	35.1	32.4	11.4			
Fry Canyon 6800	Feb. 28	31.9	32.8	10.5			103.6
Tremewan Ranch 5600	Mar. 1	14.4	28.5	4.1			
<u>Susie-Maggie Creeks</u>							
Taylor Canyon 5200	Mar. 1	24.0	35.5	8.5		87.2	103.6
AVERAGE OF NORTHERN FEEDERS:							

MARCH 1 SNOW SURVEY DATA

1. UPPER HUMBOLDT BASIN (Cont.)

Elevation feet	Date	Snow depth: inches	Density percent	Water content: inches	Normal Water content: March 1	Percentage of March 1 normal:	Seasonal percentage of normal at U.S.W.B. stations Nov.-Feb.
<u>Southern Feeders</u>							
<u>Trout-Starr-Secret</u>							
<u>Creeks</u>							
Trout Creek 8500	Mar. 1	53.7	32.6	17.5			
Trout Creek 6900	Mar. 1	27.0	33.3	9.0			
Dorsey Basin 8100	Feb. 28	50.1	28.0	14.0	13.0	107.7	125.7
Dry Creek 6500	Feb. 28	28.6	26.5	7.6			
Ryan Ranch 5775	Feb. 27	14.1	30.7	4.3			
<u>Lamoille-Rabbit</u>							
<u>Creeks</u>							
Lamoille Canyon 9000	Mar. 3	64.7	36.7	23.8	29.5	80.7	
Lamoille Canyon 9000 †	Mar. 3	59.4	40.0	23.7			
Lamoille Canyon 8500	Mar. 2	56.3	32.8	18.5			
Lamoille Canyon 8100	Mar. 2	42.8	31.1	13.3			
Lamoille Canyon 7600	Mar. 2	41.1	30.9	12.7	12.7	99.2	138.8
Lamoille Canyon 7400	Mar. 1	39.8	31.0	12.4			

† Cross course

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MARCH 1 SNOW SURVEY DATA

1. UPPER HUMBOLDT BASIN (continued)

Elevation feet	Date	Snow depth inches	Density percent	Water content: inches	Normal water content: March 1	Percentage of: March 1 normal	Seasonal percen- tage of normal at U.S.W.B. stations Nov.-Feb.
Southern Feeders (Cont.)							
South Fork-							
Ruby Lake							
Corral Canyon	Mar. 3	52.7	30.1	15.8			
Green Mountain	Mar. 5	44.0	32.1	14.1			
Harrison Pass							
No. 2	Mar. 4	26.6	28.9	7.7)			
Harrison Pass					7.9	89.9	97.8
No. 1	Mar. 4	22.4	29.0	6.5)			
Hager Canyon	Mar. 9	55.3	38.0	21.0			
Cave Creek	Mar. 9	40.6	39.8	16.2			
AVERAGE OF SOUTHERN FEEDERS:						92.5*	113.5*

* The average for the Southern Feeders is computed by weighting the three groups of stations representing South Fork, Lamaille Creek, and Starr Creek on the basis of 2, 1, and 1/2 representing their relative contributions to the flow of the main Humboldt.

11. LOWER HUMBOLDT BASIN

Temperature departure Nov.-Feb. Winnemucca $+1.8$

Mean temperature above freezing 12.2°F. (accum.)

Elevation feet	Date	Snow depth: inches	Density percent	Water content: inches	Normal water content per. 1	Percentage: of Mar. 1	Precipitation (U.S.W.B. per- centage Nov.- Feb.)
Rock Creek-Little Humboldt Mides 7000	Mar. 1	29.1	31.6	9.2*			
Little Humboldt Basin							
Lamance Creek 7000	Feb. 26	33.0	31.6	10.4			Paradise-
Granite Peak 8600	Mar. 4	40.4	35.6	13.7	13.7	100.0	Orovada (4,650-
Martin Creek R.S. 7000	Mar. 3	29.2	28.3	8.3	8.5	97.6	4,300 ft.)
Upper Buckskin Mt. 8200	Mar. 2	31.0	36.7	11.2	12.5	75.2	
Lower Buckskin Mt. 6800	Mar. 2	27.3	27.6	7.6			
AVERAGE LITTLE HUMBOLDT BASIN						90.9	117.2
Reese River Basin							
Big Creek							Austin
Cabin Course	Feb. 27	19.9	24.6	4.9			(6,594 ft.)
Big Creek Camp Ground	Feb. 27	17.5	26.8	4.7			111.9
Upper Big Creek 8000	Feb. 27	31.4	21.0	6.6			
Reese River							
Lower Corral	Mar. 2	9.8	50.8	3.0			
Upper Corral	Mar. 1	19.0	26.2	5.0			

MARCH 1 SNOW SURVEY DATA

EASTERN NEVADA

Temperature Departure Nov.-Feb. Ely °F.

Mean temp. above freezing 4.2°F. (accum.)

Elevation feet	Date	Snow depth: inches	Density: percent	Water content: inches	Normal water: content Mar.: 1 inches	Percentage: of Mar. 1: normal	Precipitation (U.S. W.B.) Percentage Nov.- Feb.
Stoptoe Valley							
Murray Summit	Mar. 2	14.3	26.0	3.7			Ely (6,257 2.37 in.
Baker Creek							Lehman Caves (Nat. Mon.) 3.97 in.
Baker Creek No. 2	Mar. 2	56.0	27.9	15.6			
Baker Creek No. 1	Mar. 2	20.3	25.8	5.3			

SOUTHERN NEVADA

Temperature Departure Nov.-Feb. Las Vegas A.P. -0.5°F. approx.

Charleston Mt.							
Kyle Canyon	Mar. 1	26.2	31.3	8.8			Charleston R.S. 6.95 in.
Kyle Canyon	Mar. 6	17.4	30.8	5.4			
Rainbow Canyon	Mar. 1	33.2	31.6	10.5			
Lee Canyon	Mar. 8	32.5	30.3	9.9			
Lee Canyon	Mar. 7	26.1	30.0	7.8			
Bald Mountain							
Peterson Canyon and							
Bald Mountain Creek	Mar. 2	23.2	26.9	6.2			Sheldon (6,500 ft.) 4.24 in.
Mahogany Mountain							
Virgin	Mar. 1	11.8	25.5	3.0			

WILDLIFE REFUGES

Sheldon National Antelope Refuge (Northern Washoe County)

Temperature Departure Nov.-Feb. Cedarville -1.5°F. (Jan. lacking)

Comparison of March 1 Snow-Survey Data
1936-1942
Water Content only

Courses	Elevation feet	1942	1941	1940	1939	1938	1937	1936
1. Upper Humboldt Basin:								
Northern Feeders :								
Marys River :								
Bear Creek :	8100	18.3	14.2	15.3	16.6	16.3	15.6	22.5
Fox Creek :	6900	9.8	7.6	5.7	8.7	7.2	9.1	13.6
Marys River :	8000	17.7		14.7	16.5	14.2	14.9	25.4
Marys River-North Fork :								
Big Bend :	6800	10.2	9.9	6.4	7.2	8.2	9.4	16.4
Gold Creek R.S. :	6300	8.1	6.2	4.7	4.5	4.8	7.8	11.2
North Fork :								
Jack Creek :	7800	11.5	9.4	8.9	12.9	4.5	7.3	15.4
Jack Creek :	7000	6.7	4.2	1.3	7.9	2.4	4.4	8.2
Rodeo Flat :	7000	11.4	10.5	7.5	11.0	6.5	8.6	18.8
Fry Canyon :	6800	10.5	9.2	6.5	10.0	7.2	10.0	18.1
Tremewan Ranch :	5600	4.1	3.2	0	2.4	0	4.9	5.5
Susie-Maggie Creeks :								
Taylor Canyon :	5200	8.5	8.5	3.0	5.6	4.9	7.8	10.3
Southern Feeders :								
Trout-Starr-Secret Creeks :								
Trout Creek :	8500	17.5	24.9	19.7	19.6	16.1	22.7	28.8
Trout Creek :	6900	9.0	6.5	7.4	5.0	6.5	8.6	8.6
Dorsey Basin :	8100	14.0	9.6	11.3	8.1	6.1	10.0	19.8
Dry Creek :	6500	7.6	6.6	3.2	3.6	5.8	9.6	11.0
Ryan Ranch :	5775	4.3	0.4	0.5	1.6	1.5	4.8	3.5
Lamoille-Rabbit Creeks :								
Lamoille Canyon :	9000	23.8	22.7	20.4	23.4	19.0	20.3	36.5
Lamoille Canyon :	9000+	23.7	21.3	19.4	22.7	16.3	20.5	34.2
Lamoille Canyon :	8500	18.5	15.3	14.7				
Lamoille Canyon :	8100	13.3	11.2	11.8	12.6	10.7	12.9	17.4
Lamoille Canyon :	7600	12.7	9.4	9.1	9.4	9.2	10.5	14.1
Lamoille Canyon :	7400	12.4	10.2	7.4	8.6	8.9	10.3	14.3
South Fork-Ruby Lake :								
Corral Canyon :	8500	15.8	13.2	14.4	16.1	11.3	8.1	16.5
Green Mountain :	8000	14.1	13.7	13.1	13.3	11.1	11.8	20.6
Harrison Pass No. 2 :	7400	7.7	6.0	4.9	5.3	5.5	5.6	8.0
Harrison Pass No. 1 :	6600	6.5	5.4	4.6	5.1	4.4	5.2	7.9
Hagar Canyon :	8500	21.0	14.8	19.3				
Cave Creek :	7000	16.2*	0	12.4				

+ Cross Course

* New course relocated in more favorable snow cover at same elevation.

Comparison of March 1 Snow Survey Data
1936-1942 (continued)

Water Content only

Courses	Elevation feet	1942	1941	1940	1939	1938	1937	1936	
2. Lower Humboldt Basin:									
Rock Creek-Little Humboldt River									
Midas	7000	9.2*	7.3	5.2**					
Little Humboldt Basin									
Lamance Creek	7000	10.4	11.9	9.9	8.7	6.9	11.0	19.9	
Granite Peak	8600	13.7	15.7	15.0	12.8	13.5	7.9	12.8	
Martin Creek R.S.	7000	8.3	7.8	6.8	5.8	8.1	6.0	7.5	
Upper Buckskin Mt.	8200	11.2	13.4	10.8	8.0	7.2	6.8	13.3	
Lower Buckskin Mt.	6800	7.6	8.4	5.8	6.7	8.1	8.3	11.1	
Reese River Basin									
Big Creek									
Upper Big Creek	8000	6.6							
Cabin Course		4.9							
Camp Ground		4.7							
Reese River									
Upper Corral	8500	5.0							
Lower Corral	7500	3.0							
3. Eastern Nevada									
Steptoe Valley									
Murray Summit	7500	3.7							
Baker Creek									
Baker Creek No. 2	8950	15.6							
Baker Creek No. 1	7950	5.3							
4. Southern Nevada									
Charleston Mountain									
Kyle Canyon	8200	8.8							
Kyle Canyon	7400	5.4							
Rainbow Canyon	7800	10.5							
Lee Canyon	9000	9.9							
Lee Canyon	8300	7.8							
5. Nevada Wildlife Refuges									
Sheldon Antelope Refuge:									
Bald Mountain									
Peterson Canyon and									
Bald Creek	6720	6.2	5.9						
Mahogany Mountain									
Virgin	5680	3.0	5.3						
Ruby Lake Wildlife Refuge									
Hagar Canyon	8500	21.0	14.8						
Cave Creek	7000	16.2***	0						

* On basis of depth at Midas and density at Lamance Creek.

** Feb. Measurement

***New Course relocated in more favorable snow cover at same elevation.

WINTER PRECIPITATION

(U. S. Weather Bureau)

1. Upper Humboldt Basin

Northern Feeders

Stations	Marys River		North Fork		Maggie-Susie Crs. Tuscarora
	Jarbridge	Mala Vista Ranch	North Fork	Owyhee	
Elevation (Ft. alt.)	(6,100)	(5,585)	(6,500)	(5,400)	(6,400)
November	0.50	1.51	0.87	0.85	0.88
December	2.16	1.30	1.41	1.46	1.35
January	2.65	1.49	1.35	1.64	1.67
February	2.00	0.96	1.53	1.79	1.28
Total	7.31	5.26	5.21	5.74	5.18

Weather Bureau

Normal

(Nov. Feb.)

4.64 5.10 6.02

Seasonal Percentage
of Normal

112.3 112.5 86.0

Area Percentage

103.6

Northern Feeders 103.6

Southern Feeders

Stations	Trout-Starr-Secret Creeks			Lamoille-Rabbit Creeks		South Fork	
	Wells	Clover Valley	Arthur	Lamoille	Elko	Hylton	Ruby Lake
Elevation (Ft. alt.)	(5,633)	(5,800)	(6,500)	(6,290)	(5,077)	(7,081)	
November	2.09	2.60	2.37	2.56	2.01	1.36	1.75
December	1.38	1.50	1.84	3.43	1.27	1.20	1.69
January	1.25		0.85	1.30	1.42	1.48	1.16
February	1.44		2.13	1.82	1.14	0.89	1.29
Total	6.16		7.19	9.11	5.84	4.93	5.89
Normal (Nov. Feb.)	4.00	6.21	7.38	6.25	4.43	5.04	

Seasonal Percentage
of Normal 154.0

97.4 145.8 131.8 97.8

Area Percentage

125.7

138.8

97.8

Southern Feeder

113.5

WINTER PRECIPITATION

(U. S. Weather Bureau)

2. Lower Humboldt Basin

Stations	Paradise Valley	Orovada	Austin	Battle Mountain	Winnemucca	Rye Patch Dam	Love- lock
Elevation (Ft. alt.)	(4,650)	(4,300)	(6,594)	(4,113)	(4,287)	(4,161)	(3,977)
November	1.03	1.23	1.30	0.94	1.23	0.76	0.41
December	1.19	1.13	1.91	0.55	1.35	0.60	0.91
January	1.46	1.63		0.46	1.36	1.36	1.00
February	1.02	0.91	1.58	0.50	0.79	0.26	0.55
Total	4.70	4.90	4.79	2.45	4.73	2.98	2.87
Normal (Nov.-Feb.)	4.10	4.09	4.28	2.54	3.70		1.71
Seasonal Percentage of Normal	114.6	119.8	111.9	96.5	127.8		167.8
Area Percentage	117.2		111.9	112.2		167.8	

3. Eastern Nevada			4. Southern Nevada		5. Wildlife Refuges	
Station (Ft. alt.)	Ely (6,257)	Lehman Caves (Nat. Mon.)	Charleston R.S. (7,165)		Ruby Lake	Sheldon (6,500)
Nov.	0.67	0.68	1.80		1.75	1.35
Dec.	0.80	1.66	3.53		1.69	1.53
Jan.	0.63	0.66	T		1.16	0.57
Feb.	0.27	0.97	1.62		1.29	0.79
Total	2.37	3.97	6.95		5.89	4.24
Normal (Nov.-Feb.)						
Seasonal Percentage of normal						

WINTER RUNOFF 1941-1942

(acrefeet)

Humboldt River at Palisade

	1940-1941	1941-1942	Normal
Nov. 1,570		10,997	6,020
Dec. 2,200		16,459	6,780
Jan. 3,840		16,550	8,310
Feb. 13,346		20,269	15,810
Total 21,036		64,275	36,920
(Nov.-Feb)			

Martin Creek at U.S. Gaging Pt.

	1940-1941	1941-1942	Normal
	510	400 approx.	
	550	500 "	
	555	600 "	
	2,650	800 "	
	4,265	2,300 "	3,014

Seas. percentage

1940-1941.....	57.0
1941-1942.....	174.1

WINTER TEMPERATURE DEPARTURE FROM NORMAL °F.

	Elko		Winnemucca	
	1940-1941	1941-1942	1940-1941	1941-1942
November	-2.6	0.0	-2.1	+6.8
December	+4.0	+ 4.7	+4.3	+5.0
January	0.0	+ 0.8	+5.3	-2.8
February	+4.0	- 5.5	+6.2	-1.9
Average	+1.4	0.0	+3.4	+1.8

MEAN TEMPERATURE DURING WINTER ABOVE 32°F (freezing).

	Elko		Winnemucca	
	1940-1941	1941-1942	1940-1941	1941-1942
November	0.3	2.8	4.3	9.8
December	0	0	2.3	5.0
January	0	3.1	1.9	3.7
February	0.9	3.2	7.7	9.2
Total,	1.2	9.1	16.2	25.7

WELL MEASUREMENTS

March 1

Upper Humboldt Valley
(Average of 7 wells)
To water level

1941.....	12.90 ft.
1942.....	9.19 ft*

*Mar. 21

Lamoille Valley
(Average of 5 wells)
To water level

1935.....	5.03 ft.
1936.....	3.72 ft.
1937.....	3.57 ft.
1938.....	4.50 ft.
1939.....	3.92 ft.
1940.....	4.50 ft.
1941.....	5.70 ft.
1942.....	3.80 ft.

FORECAST

Until a further analysis can be made of the snow cover April 1 and the precipitation and runoff during April, only a general forecast of trends in the seasonal flow for March-July will be attempted.

The snow cover March 1 was:

Upper Humboldt Basin

Northern Feeders.....	87.2 percent
Southern Feeders.....	92.5 "
Lamoille Creek.....	90.0 "
South Fork.....	89.9 "
Runoff at Palisade.....	89.9 "

Lower Humboldt Basin

Little Humboldt Basin.....	90.9
Guinn River.....	90.9
Reese River	No normal (U.S.W.B. 111.9 percent)

The winter precipitation as measured by the U. S. weather Bureau corresponds broadly with the snow surveys in percentage of normal, being 103.6, 113.5, 117.2, 111.9 for the Northern and Southern Feeders of the Humboldt, the Little Humboldt Basin, and Reese River respectively.

The temperature in February was low as was the mean temperature above freezing. The snow March 1 at the lower snow courses was deeper than usual, though not excessive. Snow was reported on the floor of the upper valley of the Humboldt but not at Austin in the Reese River Basin or Paradise Valley in the Little Humboldt.

The wells in Humboldt and Lamoille Valleys in March were much higher than at the same time last season and in Lamoille Valley they were the highest since 1936 and 1937, indicating that the water table is high and will absorb less water than usual from the melting snow with consequent increase in the streams.

Finally, the winter runoff at Palisade was 174.1 percent of normal as compared with only 57.0 percent in 1940-1941. This higher flow has not only primed the stream bed but has filled the Pit-Taylor Reservoir of 40,000 acrefeet capacity and steadily raised the level of the Rye Patch Reservoir to approximately 50,000 acrefeet, the largest storage accumulated since its construction five years ago.


There is therefore abundant reason to expect that the percentage of the snow cover will be realized in the flow of the streams or that there will be at least sufficient for all usual needs.

In Eastern Nevada, in Steptoe Valley, the snow cover was slightly less than a year ago, and in Southern Nevada on Charleston Mountain, the snow cover was approximately normal, though less than half of the abnormal snow cover of 1941.

However, the precipitation at Las Vegas for the same period was only 44.3 percent of normal.

In the Wildlife Refuges, the snow cover was slightly less than a year ago at the Sheldon Refuge but at Ruby Lake Refuge was half more.

Nevada Agricultural Experiment
Station
Reno, Nevada
April 15, 1942


J. E. Church, Meteorologist and
Forecaster

